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THE INFLUENCE OF PROLONGED PREMATURE RUPTURE OF MEMBRANES (PPROM) ON THE FETUS. Vallopp Kanjanapone, Kenneth A. Kappy, Marguerite J. Herschel, Curtis L. Cetrulo, Joseph L. Kennedy, Jr., Tufts University School of Medicine, St. Margaret's Hospital for Women, Depts. of Peds. & Ob-Gyn., Boston. (Spon. by Timos Valaes).

A conservative approach to non-delivery of women with prolonged premature rupture of membranes (PPROM) before 36 wks. was associated with congenital postural deformities and hypoplastic lungs but not with neonatal asphyxia or sepsis. PPRM > 24 hrs. occurred in 89 infants (15.8/1000 deliveries 1975-1977). Positional foot deformity (PFD), congenital dislocation of hips (CDH) and hypoplastic lungs (HL) were present only with PPRM at 28 wks. gestation or less.

PPROM	> 24 hrs.	15-24 wks.	13-15 wks.	PFD	CDH	HL
≤ 28 wks.	21 (23.6%)	15 (18.5%)	6 (7.5%)	5/21 (23.8%)	1/21 (4.8%)	4/21 (19%)
> 28 wks.	68 (76.4%)	66 (81.5%)	2 (25%)	0	0	0
TOTAL	89	81	8	5	1	4

The incidence of PFD and CDH in this group was significantly higher than in all newborns (5.5% and 1.1% vs. 0.4% and 0.5% respectively). 3/89 (3.3%) of the infants were stillborn; 8/89 (9.0%) died; 8/11 perinatal deaths were < 1000 gm. There was no difference in the incidence of neonatal asphyxia in PPRM infants matched for gestational age and birth weights with non-PPROM controls. The one PPRM infant with infection survived Group B streptococcal septicemia.

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SHOCK: NEONATAL HYPOPERFUSION SYNDROMES AND MUSCLE SURFACE pH (pH_m). LaGamma, E.F., Krauss, A.N., Auld, P. A.M. Perinatology Cent., Dept. Pediat. New York Hosp. Cornell Med. Center, New York, N. Y. 10021.

Low perfusion states are inadequately defined by standard methods in the Neonatal ICU. Using a stepwise induction of hemorrhagic shock in 7 spontaneously breathing nembutal-sedated laboratory cats, pH_m was shown to vary independently of routinely monitored parameters and most strikingly, autonomous of blood pH (0-1.21 difference). In 4 critically ill human infants (760-3500 gms) pH_m was shown to fall during states known to be associated with tissue underperfusion although compensatory mechanisms maintained the patient at clinically acceptable levels. During hypotensive episodes, acute volume expansion with PRBC or albumin resulted in an average transient rise in pH_m of 0.18 pH units (range 0.11-0.27) with no significant change in blood pH. Trends associated with a rising mean aortic blood pressure and general improvement correlated with pH_m returning to "healthy" values in HMD patients (range 6.52-7.47). There were no complications in monitoring up to 6 days. This study demonstrates (1) pH_m can be used as an independent indicator of tissue perfusion at the end organ; (2) blood volume expansion temporarily increases tissue perfusion in critically ill neonates; (3) newborn and premature infants can regulate blood flow to non-vital organs (muscle); (4) this previously inaccessible information in the newborn nursery may help reduce neonatal morbidity and mortality by permitting earlier diagnosis of shock and institution of appropriate therapy.

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INFLUENCE OF VARIOUS MATERNAL FACTORS ON FETAL OUTCOME. Michael Kappy, Marie Wittwer, John Gaines, Harlan Giles, and Elsa Sell, (Spon. by Grant Morrow

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A 5-year retrospective study of 4,430 deliveries assessed the influence of maternal obesity, pre-pregnant weight, weight gain, age, and diabetes on fetal outcome. Male babies were heavier than females (p<.05). Thus different curves may be needed to determine the designation "LGA" in some populations. Obese mothers, mothers who gained > 30 lbs. during their pregnancy, and Class A diabetics all had heavier babies and increased numbers of LGA births compared to controls (p<.01). When obesity and diabetes were present, 66.7% of the births were LGA vs. 12.1% for controls (p<.01).

The prevalence of major malformations correlated only with maternal diabetes, where there was a 4-fold increase over controls (11.3% vs. 2.7%, p<.05). Perinatal mortality was affected by maternal factors only insofar as they adversely affected birthweight or gestational age. Diabetes however, resulted in increased mortality at all birthweights and gestational ages, and gave an overall perinatal mortality rate of 143/1000 births, which was almost 4 times greater than controls (p<.01).

Maternal obesity, pre-pregnant weight, weight gain and diabetes are significant determinants of birthweight and the percentage of LGA births, whereas only maternal diabetes was found to directly increase the prevalence of major malformations or the perinatal death rate.

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HEART RATE AND HEART RATE VARIABILITY IN NORMAL AND ABORTED SIDS INFANTS DURING SLEEP. Hedi L. Leistner, Gabriel G. Haddad, Mary A.F. Epstein, Ralph A.

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Heart rate (HR) and HR variability were studied in 15 normal infants and 6 infants with aborted Sudden Infant Death Syndrome (SIDS) during sleep at monthly intervals through 4 months of age. The RR interval (inverse of heart rate) was measured to an accuracy of 0.2 msec. Sleep was staged using EEG, EOG, EMG and behavioral criteria.

The median HR was 4 to 10% greater in the aborted SIDS infants at each age in both sleep states and this was significant at 2, 3 and 4 months in quiet and at 3 months in REM sleep (p < 0.05, Wilcoxon Rank Sum test). The beat to beat variability of the HR (ΔRR) in the aborted SIDS infants was 6 to 40% smaller than in the normal infants in both REM and quiet sleep at each age studied. The interquartile range of the HR, a measure of overall variability in HR, was the same in the aborted SIDS and normal infants. In both groups, the HR and its interquartile range were greater in REM sleep.

These studies indicate that the group of infants with aborted SIDS may be differentiated from the normal infants by their increased heart rate and decreased beat to beat variability, and that these findings may reflect abnormal autonomic regulation of the heart rate.

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USE OF TOLAZOLINE IN INFANTS WITH SEVERE HYPOXEMIA ASSOCIATED WITH PULMONARY DISEASE. D.S. Kasting, R.A. Darnall, D.K. Stevenson, R.L. Ariagno, J.D. Johnson

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Following our initial report regarding the use of tolazoline in infants with persistent pulmonary hypertension, we have reviewed our subsequent experience with this drug in patients with hyaline membrane disease (HMD) and meconium aspiration syndrome (MAS) who had severe hypoxemia unresponsive to usual therapy. From 10/74-10/77 we infused tolazoline to infants on assisted ventilation when their PaO₂ fell below 50 torr while in an FiO₂ of 1.0 and requiring peak inspiratory pressures of > 40 cm H₂O. A bolus of 1-2 mg/kg was given via scalp vein, followed by 1-2 mg/kg/hr to a maximum of 10 mg/kg/hr. Five of 15 patients with HMD who met this criteria survived, with only one survivor weighing < 1500 gm. Overall survival in infants with HMD was 71%. Seven of 15 infants with MAS survived compared to an overall survival of 82% with MAS. Following tolazoline the initial increase in PaO₂ was greater in surviving infants of both groups, but hypotension developed more commonly in infants with HMD. Poor prognostic signs following

PaO ₂ RESPONSE: RDS	RDS		MAS		MEAN ART. BP (mmHg)	
	Surv.	NonSurv.	Surv.	NonSurv.	RDS	MAS
1 Rx	29.8±13.5	47.3±14.2	37.1±09.3	27.0±08.4	43.6±10.1	51.2±10.1
5 Rx	126.0±86	67.8±25.2	110.7±71.3	70.5±32.4	32.5±07.6	49.2±10.4

tolazoline include: poor response of PaO₂, development of hypotension and requirements for concentrations of tolazoline greater than 2 mg/kg/hr.

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OUTCOME OF VERY-LOW-BIRTH WEIGHT INFANTS. John W. Liedel, Bruce D. Boyd, Gerda I. Benda, and S. Gorham

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A study was undertaken to determine the incidence of subsequent handicaps in children who were of very-low-birth weight. From 1968 through 1976, 59 infants with birth weights of 1000 grams or less, and less than 72 hours old upon admission, were discharged from the Neonatal Intensive Care Center at the University of Oregon Health Sciences Center. Forty-three children, thirty-two girls, and eleven boys, were seen in follow-up for psychological testing. Their mean birth weight was 912 grams, and mean gestational age was 28.6 weeks. Seven children were small for gestational age (SGA), 36 were appropriate for gestational age (AGA). Their mean age was 3.7 years (range 6 months to 9 years). Six children (14%) have cerebral palsy, two seizure disorders, one has hydrocephalus, and one has impaired vision due to retrolental fibroplasia. Psychological testing was incomplete in two children, one has cerebral palsy and developmental delay, the other appears normal. The mean intelligence quotient for 41 children is 92.1. Thirty-two (78%) have scores greater than 80. Six (14.6%) have quotients between 70 and 80, and three (7.3%) are mentally retarded with intelligence quotients of less than 70. The mean intelligence quotient of the 7 children who were SGA is 97.1; of these, one child has cerebral palsy.

We believe these data reflect the improving prognosis of infants with very-low-birth weight.